

## **CLAIMS**

1. A device for protecting a circuit against a polarity reversal of a connection to a D.C. power supply, comprising:
  - a controllable switch interposed on said connection between a first terminal of a first voltage of said D.C. power supply and a first terminal of said circuit; and
  - 5 first means for turning-off with a delay the switch in the presence of a reverse polarity; and
  - second means for turning on the switch with a delay shorter than the turn-off delay, when the polarity is normal.
2. The device of claim 1, wherein said delay is chosen to be greater than the  
10 maximum expected duration of transient polarity reversals.
3. The device of claim 1, wherein said first terminal of the circuit to be protected is a ground connection terminal
4. The device of claim 1, wherein said first means comprise a microcontroller having an output controlling, directly or via a selective delay element, said switch
- 15 5. The device of claim 1, wherein said switch is a MOS transistor with an N channel.
6. The device of claim 5, wherein said first means comprise a first resistor connecting the gate of the transistor to said first terminal of the circuit to be protected.
7. The device of claim 6, wherein a second resistor in series with a diode connects a terminal of the device connected to a second voltage of the D.C. power supply.
- 20 8. The device of claim 7, wherein a zener diode (is connected in parallel with the first resistor.
9. A circuit, comprising:
  - a switch operable to conduct a current to a first node of a power supply when the first node has a predetermined polarity relative to a second node of the power supply; and
  - 25 a first delay coupled to the switch and operable to disable the switch from conducting current at a predetermined time after the polarity reverses.

10. The apparatus of claim 9 wherein the first delay disables the switch in response to a normal condition of the current.
11. The apparatus of claim 9, further comprising a second disabling the switch in response to a normal condition of the current.
- 5 12. The apparatus of claim 9 wherein:  
the switch comprises a transistor; and  
the first delay is operable to discharge the gate capacitance of the transistor.
13. A method, comprising:  
conducting a current between first and second supply nodes when the first node  
10 has a predetermined polarity relative to a second node; and  
disabling the conducting of current at a predetermined time after the polarity inverts.
14. The method of claim 13 wherein disabling the conducting comprises transmitting a signal.
- 15 15. The method of claim 13 wherein the conducting of current is disabled in response to a normal condition of the current.
16. The method of claim 13 wherein the first and second supply nodes are coupled to a DC power supply.
17. A system, comprising:  
20 a load;  
a power supply coupled to the load;  
a switch operable to conduct a current to a first node of the power supply when the first node has a predetermined polarity relative to a second node of the power supply; and  
25 a first delay coupled to the switch and operable to disable the switch from conducting current at a predetermined time after the polarity reverses.
18. A vehicle, comprising:

a system, comprising:

a load;

a power supply coupled to the load;

5 a switch operable to conduct a current to a first node of the power supply when  
the first node has a predetermined polarity relative to a second node of the power supply;  
and

a first delay coupled to the switch and operable to disable the switch from  
conducting current at a predetermined time after the polarity reverses.

19. The vehicle of claim 18 wherein the power supply is a DC power supply.

10 20. An integrated circuit, comprising:

a switch operable to conduct a current to a first node of a power supply when the  
first node has a predetermined polarity relative to a second node of the power supply; and

a first delay coupled to the switch and operable to disable the switch from  
conducting current at a predetermined time after the polarity reverses.